Autotympanomastoidectomy in a Case of Cholesteatoma with Foreign Body

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Received: 11 September 2008 / Accepted: 28 March 2009 / Published online: 10 April 2011
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Abstract: A unique case of foreign body of the external auditory canal (EAC) in a 16 year old boy with normal intelligence is presented. The foreign body caused the cholesteatoma to flourish behind the obstruction resulting in complete destruction of middle ear cleft and external auditory canal to form a single large cavity. The diagnosis of foreign body remained elusive till the last and could be proved only after biochemical analysis. We also discuss the Keratosis obturans, cholesteatoma of external auditory canal and the process of calcification in cholesteatoma ear, which was thought to represent the foreign body in this case.

Keywords Foreign body · Stone · Cholesteatoma · Autotympanomastoidectomy

Case Report

A 16 year old boy presented with left ear pain and scanty ear discharge for last 2 years. Earlier, he had history of recurrent bilateral discharge since childhood. He also had history of pyogenic meningitis and cerebellar abscess in June 2001 for which he received i.v antibiotics and burr hole aspiration of pus was done. He subsequently underwent modified radical mastoidectomy of the right side in July 2001. Otologic findings of right side was cholesteatoma disease in attic and posterosuperior region. At that time in the left ear, a shallow retraction pocket was noted. The patient had bilateral mixed hearing loss. After surgery, the right ear became dry with some hearing improvement.

Subsequently patient missed subsequent follow ups. In June 2002, he complained of scanty left ear discharge. He also complained of feeling of hitting a hard object on cleaning of left ear with cotton swab. The conservative treatment by local practitioners did not help him. He presented to ENT department, PGIMER, Chandigarh with a tender hard mass at the opening of external auditory canal in March 2004. Patient denied of putting any foreign body in the ear. A high resolution computed tomography scan revealed a large cavity in the left ear filled with homogenous soft tissue mass involving middle ear cleft and external auditory canal without any ossicles. (Fig. 1). There was discrete opacification of 2×1 cm lying anteriorly over the floor of external auditory canal. He underwent left mastoid exploration, which revealed a preformed cavity involving the antrum, aditus, attic, mesotympanum and external auditory canal filled with cholesteatoma with well defined sac and stony hard mass of 2×1 cm in the EAC (Fig. 2). No remnant of pars tensa was present. Facial nerve was intact without any dehiscence. Histopathological examination of the cholesteatoma sac revealed keratinized stratified squamous epithelium. The underlying sub-epithelium showed dense the presence of dense inflammatory granulation tissue. Abundant keratin flakes and foci of calcification were noted (Fig. 3).

The weight of foreign body was 500 mg and the consistency hard. It was light brown in color with small rough surface. It was defined as type A structure (dull defined nucleus with few laminations at the periphery). On biochemical analysis, the foreign body was mainly composed of bicarbonates. There was no trace of calcium, magnesium or phosphate ruling out de novo bone or sequestrum formation.

His left ear got dry and well epithelised after 12 weeks follow up.

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Fig. 1 HRCT temporal bone (*Axial cuts*) showing middle ear and EAC filled with soft tissue mass without any ossicles and with discrete opacified mass lying over the floor of EAC

Fig. 2 HRCT temporal bone (*coronal cuts*) showing a single large cavity involving middle ear cleft and EAC filled with homogenous soft tissue mass without any ossicles and with discrete opacification lying over the floor of EAC

Discussion

This case exemplifies the perfect circumstances for cholesteatoma to develop i.e. behind the stenosis or obstruction of external auditory canal. In this situation the cholesteatoma behaved more aggressively. The development of cholesteatoma behind the foreign body is not reported in the literature. It is amazing how both ears of person behave differently towards intracranial complications. The right side ear disease caused pyogenic meningitis and cerebellar abscess while the left sided ear disease, despite obstruction of external auditory canal did not produce any intracranial complication. The possibility of foreign body was not considered initially by absence of such history especially in grown up child with normal intelligence. Rather the

Fig. 3 Photograph showing the cholesteatoma sac (*right*) and the stone (*left*) recovered from the external auditory canal

possibilities of keratosis obturans and external auditory canal cholesteatoma were considered as more likely diagnosis. Keratosis obturans and external auditory canal cholesteatoma have often been regarded as single entity.

However these are two distinct disorders with their own clinical presentations, physical and pathological findings and treatment [1]. Keratosis obturans is an accumulation of obstructive desquamated keratin in the external auditory meatus. External auditory canal cholesteatoma is an invasion and erosion of squamous epithelium into a localized area of bony ear canal. The origin of both entities remains obscure [1]. Hawke et al. [2] have reported a case of 25 year old oriental woman with persistent and neglected keratosis obturans. The enlarging plug of keratin in the deep meatus produced an automastoidectomy in the ear. The case in discussion could be similar in that foreign body aggravated the keratosis obturans and brought an autotympanomastoidectomy.

In external auditory canal cholesteatoma, the significant finding is usually extensive erosion of bony EAC by wide mouth sac, lined with stratified keratinized squamous epithelium that arises lateral to the tympanic membrane and is located in the inferior portion of the EAC. There is frequent evidence of sequestration of underlying bone [3]. This sequestered bone piece could be foreign body of the case in discussion or it would have acted as nidus for stone formation in due course of time.

There are many other things to act as nidus for concretion formation in cholesteatoma ear. The act of self cleansing by cotton bud may leave few cotton fibres which may cause foreign body to grow.

Many studies have highlighted about the calcifications in cholesteatoma [4–6]. Osteopontin is a major acidic phosphorylated glycoprotein of bone, which participates in

the pathological calcification that occurs as a result of chronic otitis media [4].

Conclusion

We report an interesting case of an unnoticed foreign body in an adult ear that resulted in autotympanomastoidectomy through cholesteatoma formation.

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